A GRAPHIC SUMMARY OF WORLD AGRICULTURE.

By V. C. FINCH, *Formerly Assistant in Agricultural Geography, Office of Farm Management;* O. E. BAKER, *Agriculturist, Office of Farm Management,* and R. G. HAINSWORTH, *Head Draftsman, Office of Farm Management.*

THE United States has a greater acreage of land in crops than any other nation, except possibly China, for which statistics are not available. The total acreage of land in crops in the United States is nearly equal to that of all Europe, excluding Russia. The other important agricultural nations, arranged in descending order of importance according to crop acreage, are Russia, India, Germany, Austria-Hungary, Argentina, France, Italy, and Canada.

The United States also has a greater crop acreage per capita of population than any other of the great nations of the world, except the sparsely settled countries of Canada and Argentina. In the United States in 1909 the number of acres of crops per person was 3.5, and of improved land, 5.2; whereas in the Old World the acres of crops per person ranged from about 0.2 acre in Japan and 0.4 acre in the United Kingdom to 1 acre in Germany, 1.5 acres in France, and 1.6 acres in the Russian Empire.

The population of eastern and southern Asia has increased comparatively slowly in recent times, being frequently reduced by famine, but the population of Europe has increased manyfold during the past century and has now in several countries attained a density exceeding that of the Orient. According to the latest statistics, Belgium has a density of population of about 670 persons per square mile, the United Kingdom 380, Japan 370, Italy 330, Germany 320, India (British) 220, Austria-Hungary and China (proper) 200, and the United States 34.

The large amount of improved land per person in the United States and the large amount of arable but less valuable land yet unimproved, probably almost equal to the improved land in area, is in striking contrast to the great density of population across the oceans. Herein lies the basic cause of the difference in economic well-being between the Old World and the New, and of the current of westward immigration. The best statistical evidence indicates that population in the United States is now increasing somewhat more rapidly than the acreage of cropped land. The maximum acreage of improved land per capita, 5.7 acres, was attained in the census years 1880 and 1890 and dropped to 5.5 in 1900 and to 5.2 in 1910. The higher prices of farm products are in part a resultant of this pressure of population upon the food supply, and are in turn

an important factor in producing the increased yield per acre and the trend toward more intensive types of agriculture. Although the acreage of cropped land per capita has decreased for 20 years, more intensive methods of agriculture and higher yields per acre have prevented an appreciable decline in the per capita production of crops. Taking as a criterion the six more important food crops, corn, wheat, oats, barley, potatoes, and rye, the average production was higher in the two five-year periods, 1906–1910 and 1911–1915, than in the previous five-year periods for which figures are available.

Estimated acreage of land in crops, and food production of the principal countries.

Country.	Estimated acreage of land in crops.[1]	Estimated population.[1]	Estimated acres of crops per capita.	Estimated production of selected food crops expressed in terms of bushels of wheat (average of 1911–1913).[2]	Estimated production per capita of selected food crops in terms of bushels of wheat.
United States	318,526,000	91,972,000	3.5	4,170,690,000	45.3
Russian Empire[3]	[4] 275,569,000	175,138,000	1.6	3,051,135,000	17.4
China (proper)[5]	400,000,000	302,000,000	1.3	.....	.....
India (British)	219,192,000	244,268,000	.9	1,910,751,000	7.8
German Empire	65,445,000	67,812,000	1.0	1,442,349,000	21.3
Austria-Hungary	62,196,000	49,211,000	1.3	1,035,573,000	21.0
Argentina	60,829,000	7,979,000	7.6	[6] 449,086,000	56.3
France	59,128,000	39,602,000	1.5	707,815,000	17.9
Italy	51,309,000	36,120,000	1.4	346,757,000	9.6
Canada	36,939,000	7,180,000	5.1	505,219,000	70.4
United Kingdom	19,413,000	45,371,000	.4	251,892,000	5.6
Australia	14,683,000	4,951,000	3.0	122,258,000	24.7

[1] Statesman's Yearbook, 1916, except for United States and China.

[2] The relative value, without reference to protein ratio, of the different food crops per bushel used in compiling this table is based principally on Danish experiments in feeding and is as follows: Wheat, 60; corn, 56; rye, 56; oats, 32; barley, 48; potatoes, 10; clean rice, 60; millet, 48; sugar, equivalent to wheat.

[3] Exclusive of Finland.

[4] Exclusive of 95,756,000 acres of meadows.

[5] Rough estimate.

[6] Average of 1912–1914.

The following maps of the world's agriculture are designed to furnish a convenient means of comparing the geographic distribution and density of production of the more important crops and farm animals in the United States with the distribution and density in foreign countries, while the graphs at the bottom of the maps visualize the relative importance of the United States in the world's production and markets. The system of uniform-sized dots employed to show distribution does not permit of an easy computation of totals, but the value of the dot is shown for each map, and from the graphs the acreage or production of the important countries can be approximately determined. Since acreage is less subject to fluctuation than crop production, and since it affords better comparison of the im-

portance of one crop with another, statistics of area have been mapped so far as figures were available. In the maps of rice, cotton, tobacco, sugar, and coffee, however, it was found necessary to use statistics of production. All the maps represent an average of the years 1911, 1912, and 1913, compiled from official reports, except in the case of the United States, for which the statistics collected in the census of 1910 were used, and in that for the provinces of Russian Asia, which refer to the two years 1912 and 1914.

Because of the distortion resulting from any attempt to represent the curved surface of the earth on a flat map, the ratio of dot area to land area is not the same in all portions of the map, which is a Mercator projection. The density of dots in any section of the map is strictly comparable only with that of other places in the same latitude.

Data are lacking for some countries or provinces, particularly for China and the native states of India, and in such cases hachuring has been employed to show the probable distribution and density.

The following table provides a summary of the more important statistics graphically portrayed in the maps and graphs:

Production of principal crops in the principal countries: Average for 1911–1913.

Country.	Corn.	Wheat.	Oats.	Rye.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
United States	2,701,074,000	704,995,000	1,154,134,300	36,721,300
Russian Empire	78,110,000	727,133,300	1,050,574,700	935,010,300
India	87,526,700	369,612,300	.....	.....
German Empire	.....	160,236,700	595,660,700	455,181,700
France	20,557,000	324,136,700	309,380,300	48,078,700
Austria-Hungary	210,855,300	247,141,000	245,937,700	163,640,000
Italy	100,245,300	190,840,000	37,582,700	5,390,300
United Kingdom	.....	61,297,300	179,359,000	1,666,700
Argentina[1]	251,875,300	155,828,300	65,311,000	1,748,300
Canada	17,636,000	228,933,300	387,159,000	2,406,700
Australia	10,432,000	88,961,000	14,134,000	95,700

Country.	Barley.	Potatoes.	Rice.	Sugar.
	Bushels.	*Bushels.*	*Bushels.*[2]	*Long tons.*
United States	187,417,700	348,303,000	11,808,700	1,639,000
Russian Empire	484,848,000	1,287,880,700	6,151,900	1,630,700
India	38,097,700	.....	1,087,002,300	2,407,000
German Empire	157,921,700	1,698,826,000	.....	2,227,000
France	47,608,700	506,884,700	39,100	643,000
Austria-Hungary	153,437,000	642,149,000	.....	1,496,700
Italy	10,029,300	61,410,300	11,052,600	186,300
United Kingdom	62,528,300	259,482,700	.....	.....
Argentina[1]	5,096,700	38,029,000	410,300	242,900
Canada	47,370,700	78,222,300	.....	.....
Australia	2,816,700	13,842,700	.....	253,700

[1] Average of 1912-1914.

[2] 60 pounds clean rice.

LIST OF MAPS.

	Page.
Identification map	535
World population map	536
Wheat, acreage	537
Corn, acreage	538
Oats, acreage	539
Barley, acreage	540
Rice, production	541
Cotton, production	542
Flax, acreage	543
Tobacco, production	544
Potatoes, acreage	545
Sugar, production	546
Coffee, production	547
Horses, number	548
Mules and asses, number	549
Cattle, number	550
Swine, number	551
Sheep, number	552
Goats, number	553

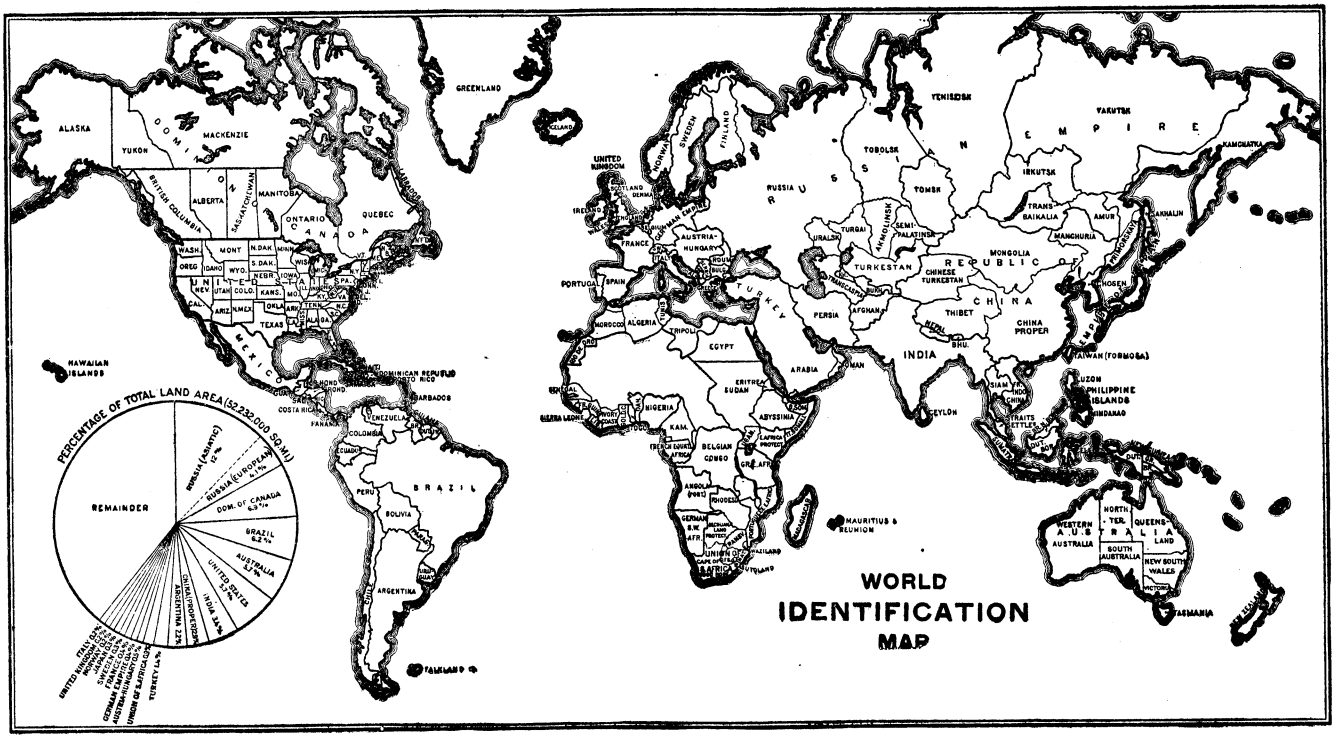

FIG. 56. *Identification map.*—The maps of the world showing the geographic distribution of the crops and live stock should be compared with this map to ascertain the name of a country. In Europe the boundaries shown are those existing in 1913, after the Balkan Wars. The Japanese name Chosen is recognized for the peninsula formerly known as Korea, and Taiwan for the island formerly known as Formosa. The Republic of China is considered as including not only China proper but also Manchuria, Mongolia, Chinese Turkestan, and Tibet, a situation more nominal than real. India is recognized as including Burma and Beluchistan. There is serious exaggeration in area in the northern and southern portions of the map, due to the Mercator projection.

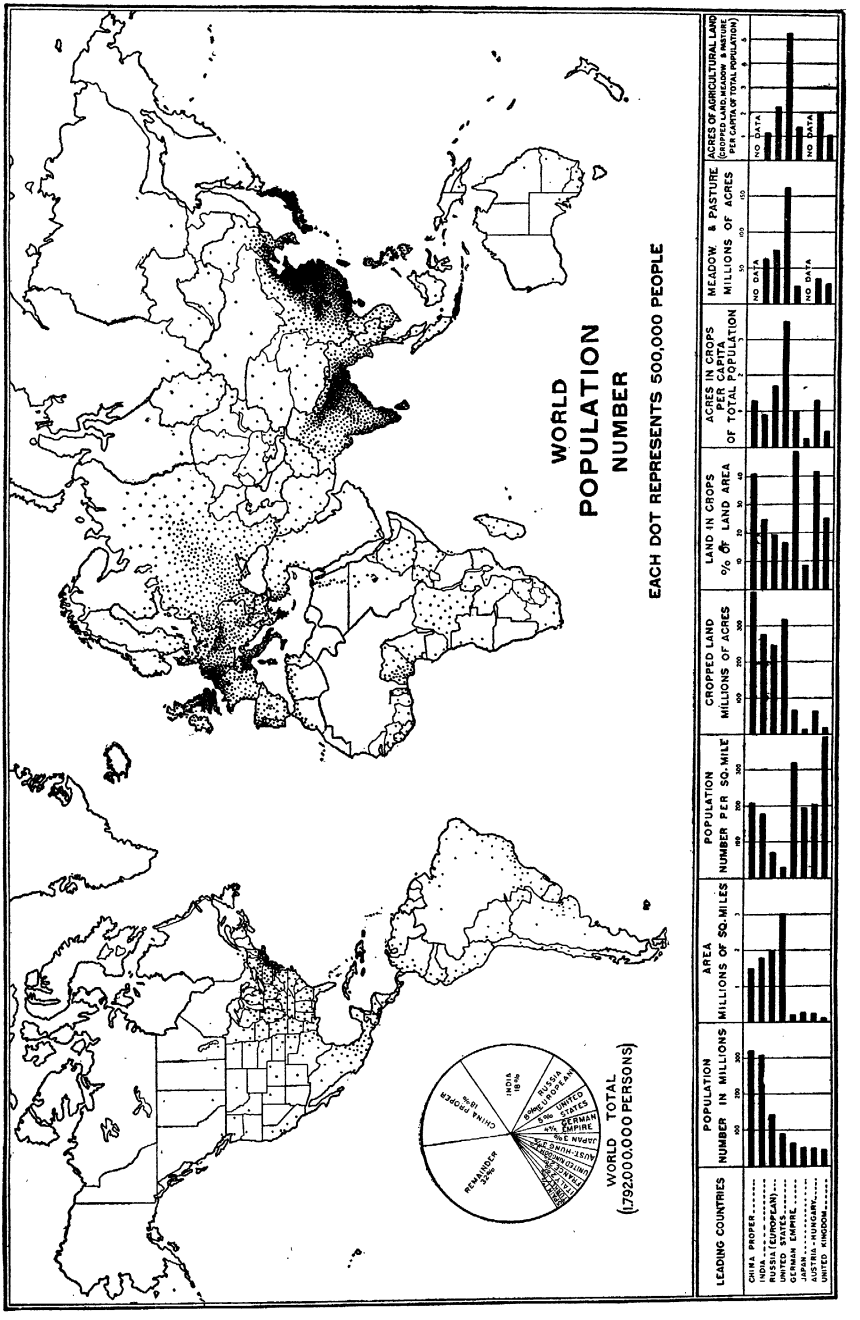

FIG. 57. *Population.*—Seven centers of dense population may be noted on the map—Japan, China, Java, India, Italy, northwestern Europe, and the coast of the United States from Boston to Baltimore. Among the nations of the world the greatest density is in Belgium, where there were at the last census nearly 700 people per square mile. The density in Massachusetts is about 420, in the United Kingdom about 400, in Germany and in Italy over 300, in China and in India about 200, while the average for the United States is 34. Of more significance is the acres of crops per person, which ranges from about $\frac{1}{2}$ of an acre in Japan, about 1 acre in India and Germany, $1\frac{1}{2}$ acres in China, and $3\frac{1}{2}$ acres in the United States, to 7 acres in Argentina.

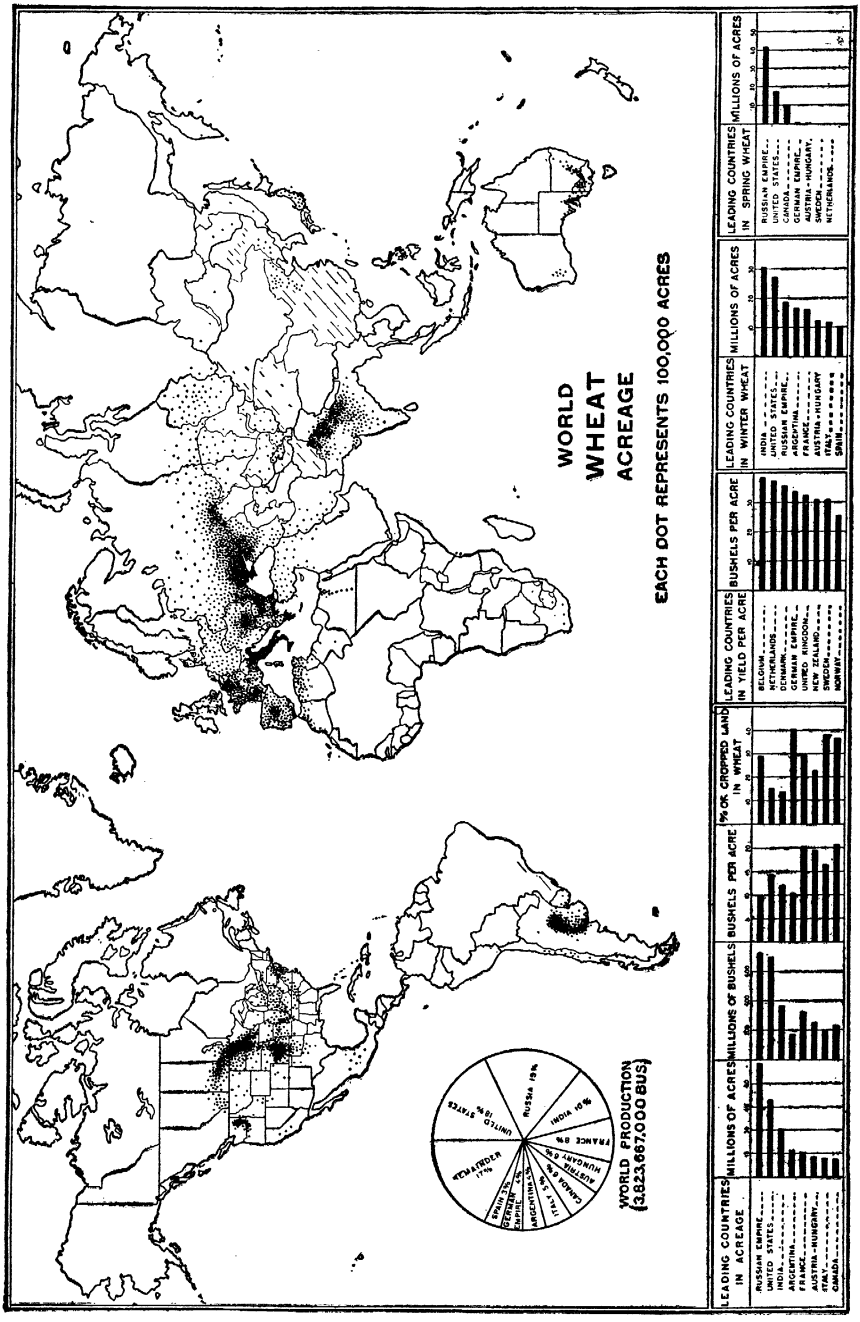

FIG. 58. Wheat.—Four widely separated wheat regions of world importance will be noted—southern Europe, central North America, India, and Argentina. Of these, southern Europe is most important, the combined acreage of all European countries being more than twice that of all North America, which ranks next. The surplus crop is grown principally in subhumid, temperate climates, where the population is sparse, the type of agriculture is extensive, the land is yet cheap, and where wheat is free in large measure from the competition of more productive crops. Most of the important wheat regions of the world have an average annual rainfall of less than 30 inches.

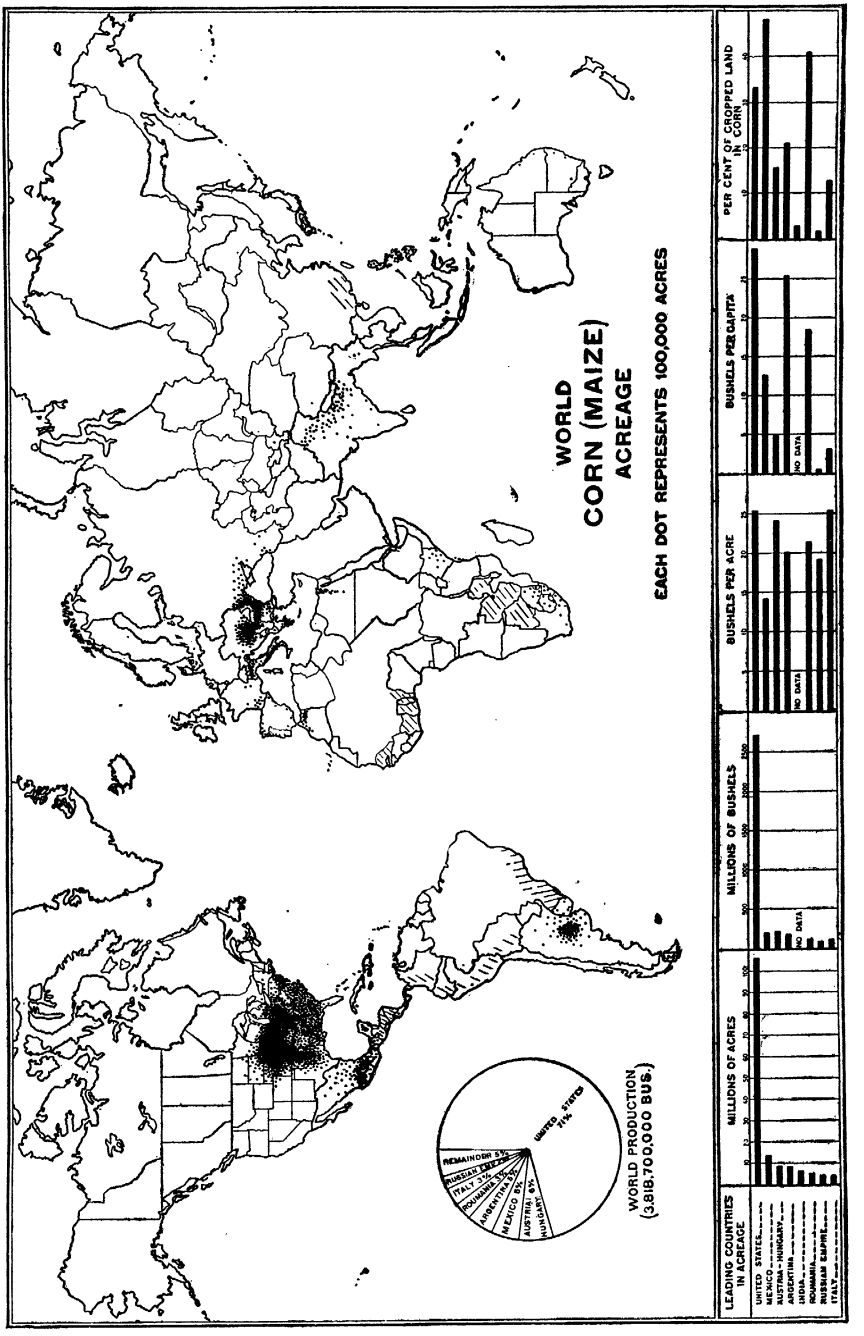

FIG. 59. *Corn.*—The corn (maize) acreage of the United States is nearly double that of the rest of the world. The other important producing regions are southern Europe, particularly Roumania and Hungary, Mexico, Argentina, and India. Relative to the population, corn is a more important crop in the United States than in any other country. Relative to the acreage of other crops, it reaches its highest importance in Mexico, where it is the staple food of the poorer classes. The highest yield per acre is found in Canada, a country of inconspicuous acreage. The corn acreage of all European countries is about equal to that of Illinois, Iowa, and Missouri.

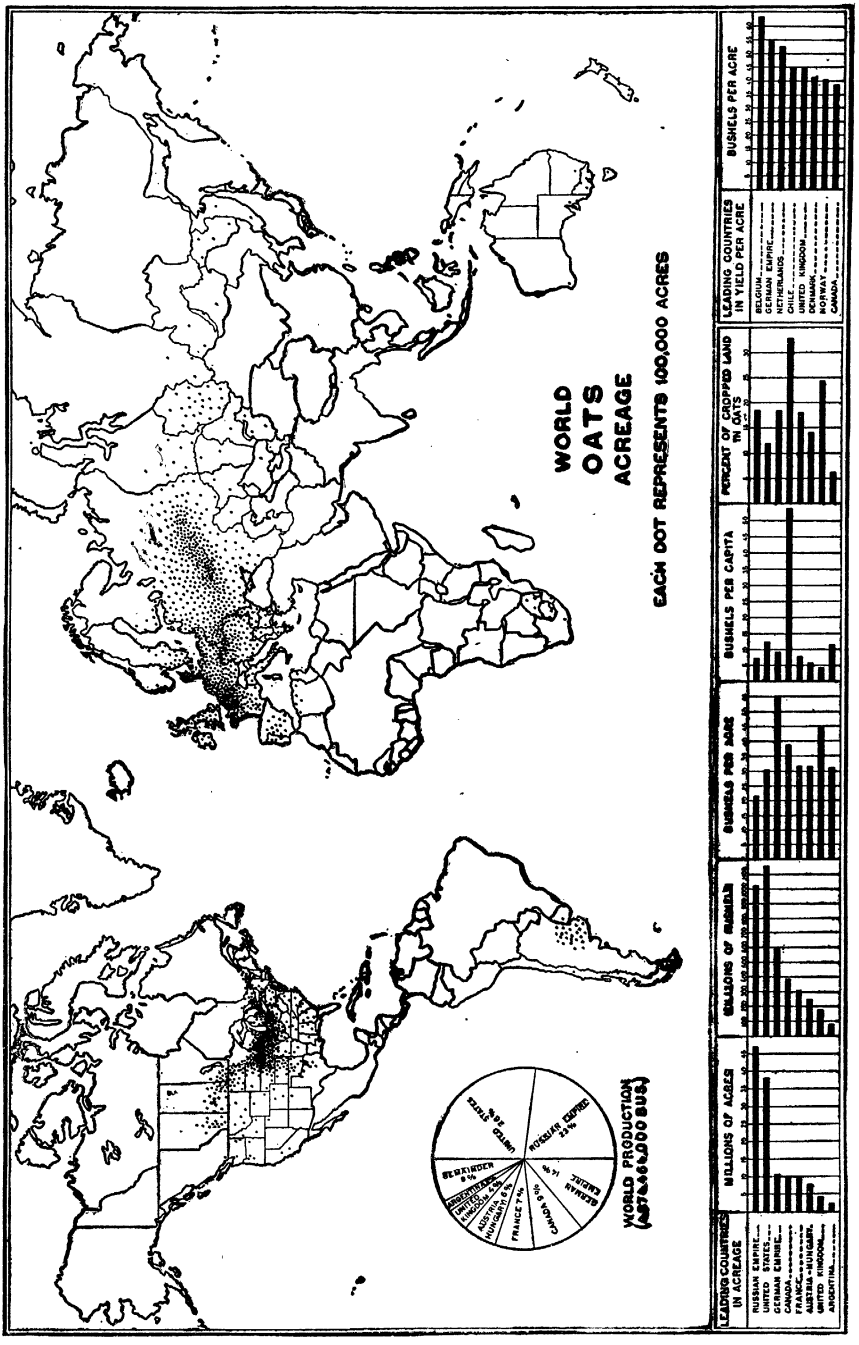

FIG. 60. *Oats.*—Oats are grown mostly in cooler and moister climates than is either wheat or barley. The three principal regions of production are in the northeastern United States and adjoining provinces of Canada, in northwestern Europe, and in Russia. The United States leads in production, Russia has the largest acreage, while the local importance of the crop, as measured by the proportion of cropped land it occupies, and the per capita production, is greatest in Canada. In yield per acre Belgium leads, as it does in wheat, rye, and barley. Most of the world's oat crop is spring sown, but in regions of mild winters it is sown in the autumn.

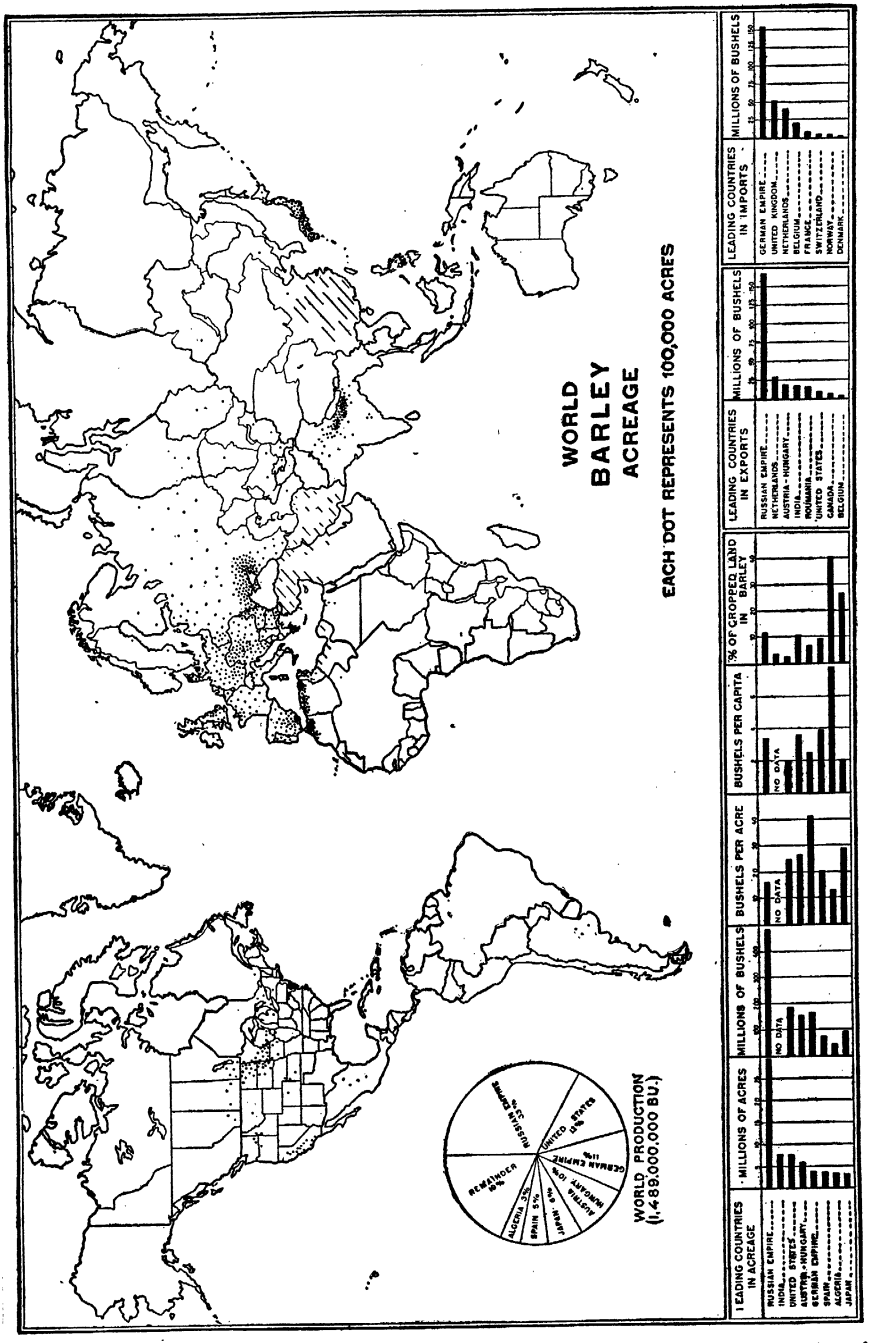

FIG. 61. *Barley.*—Barley is a less important world crop than wheat or oats. The important centers of production are southern Russia, northern Africa, southern Spain, Austria, Germany, eastern England, the north central United States, California, Japan, China, and India. The geographic distribution of barley is more widespread than that of oats and is similar to that of wheat, though extending somewhat farther north in Europe and slightly farther into the arid regions of northern Africa and America. The wide distribution of the crop results from its ability to mature in a short, warm season in high latitudes and in a short, moist season on the borders of the deserts.

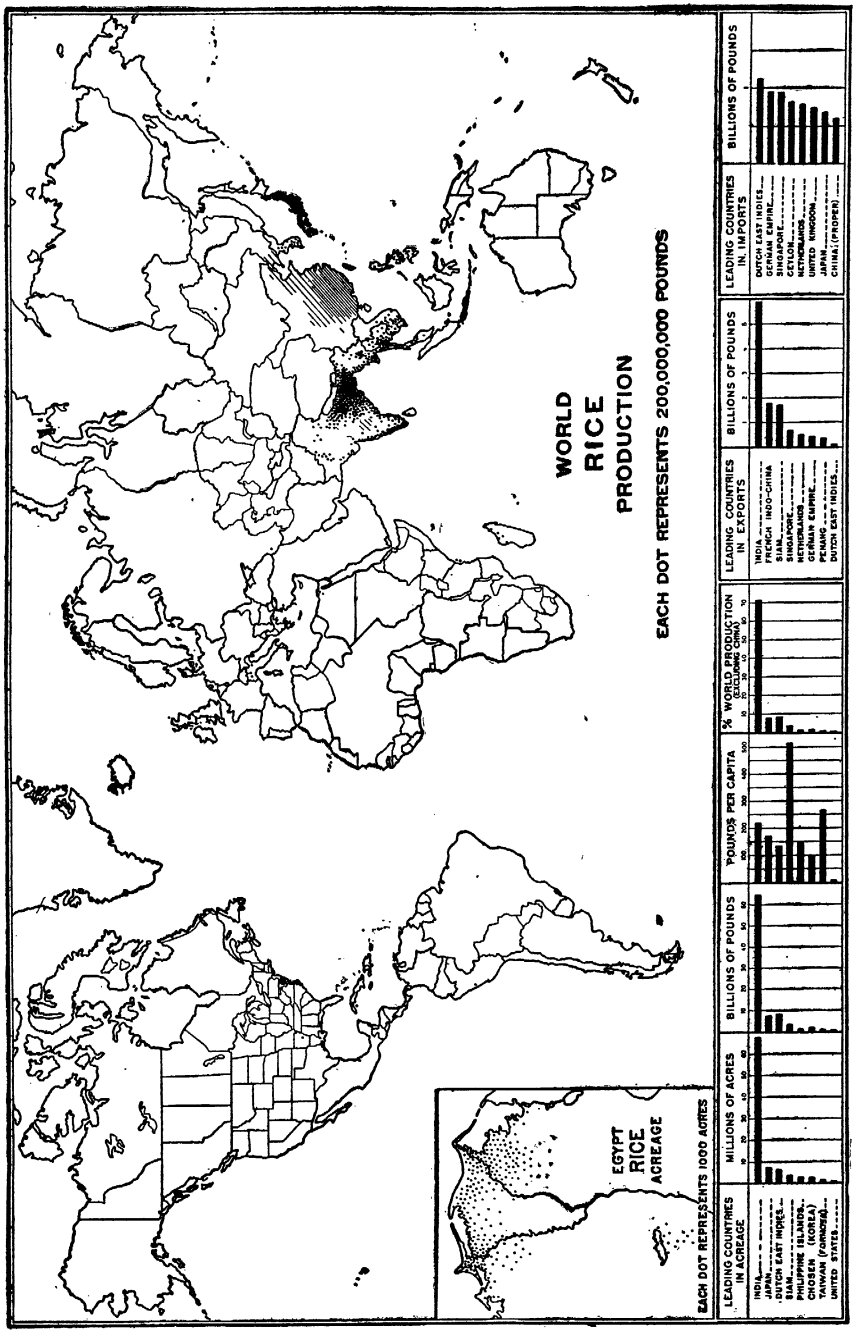

FIG. 62. *Rice.*—Rice is produced in many countries, but it is primarily the food crop of the Orient, 97 per cent of the world's production being grown in southern and eastern Asia and adjoining islands. There are many varieties of rice, most of which require irrigation. In general, rice is grown on level, wet lands, particularly river deltas such as those of the Yangtze, Ganges, Nile, Po, and Mississippi. In some regions the level land is artificially produced by terracing. For this type of agriculture the dense population and cheap labor of the Orient are necessary. The rice production of Africa and the American continents is so small that it barely shows on this map.

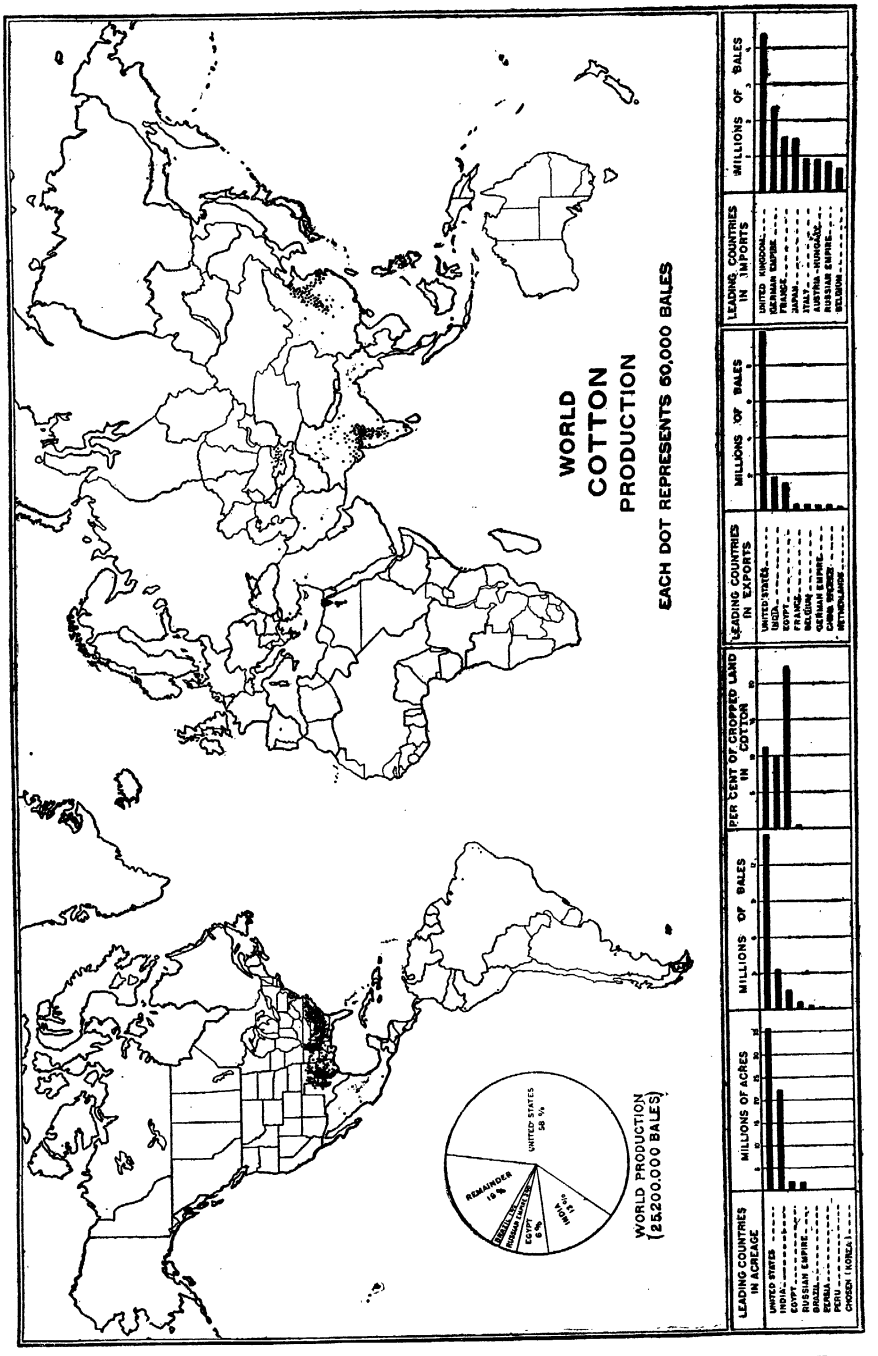

FIG. 63. *Cotton.*—The United States produces about three-fifths of the world's cotton, India and Egypt being the only other countries whose crop is of much commercial importance. China and Russian Turkestan produce considerable cotton, but the crop is consumed almost entirely within the country of production. A little cotton is grown in eastern Brazil, in Peru, in Mexico, and in Asiatic Turkey. The extensive production of cotton is restricted to regions having an average frostless season of 200 days or more, and 95 per cent of the world's crop is grown south of the 37th parallel of latitude.

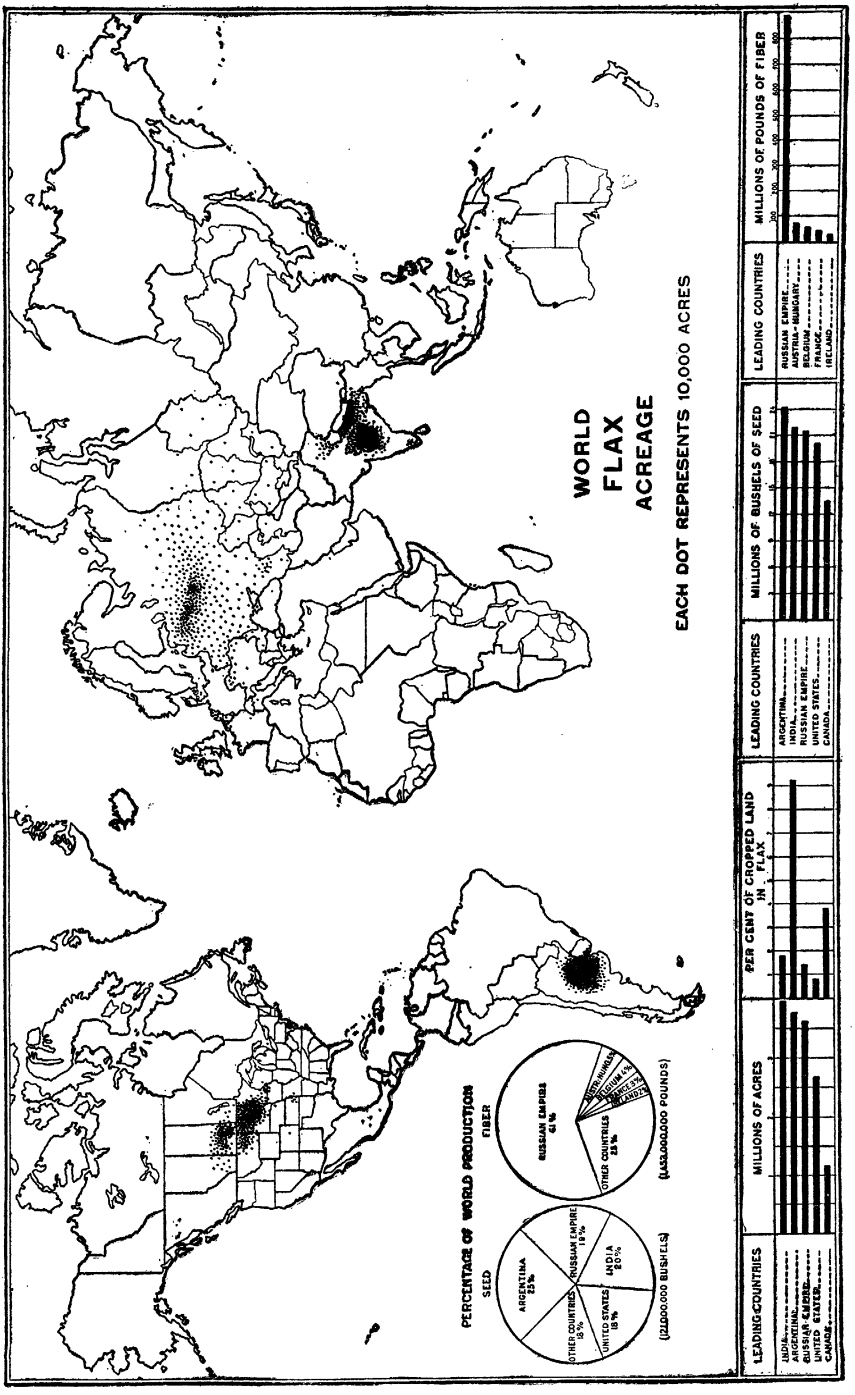

FIG. 64. *Flax.*—Flax is grown both for its fiber and its seed, but it seldom attains high quality in both at the same time. Four centers of flax culture are to be noted—India, Argentina, Russia, and United States. Of these only Russia is important in the commercial production of flax fiber. Smaller centers of fiber production are located in northern France, Belgium, and northern Ireland. In the American continents the scarcity of labor makes it difficult to produce flax fiber at a profit under existing prices. From these western centers comes the bulk of the linseed oil and flaxseed by-products of the world. In India flax is grown for its seed.

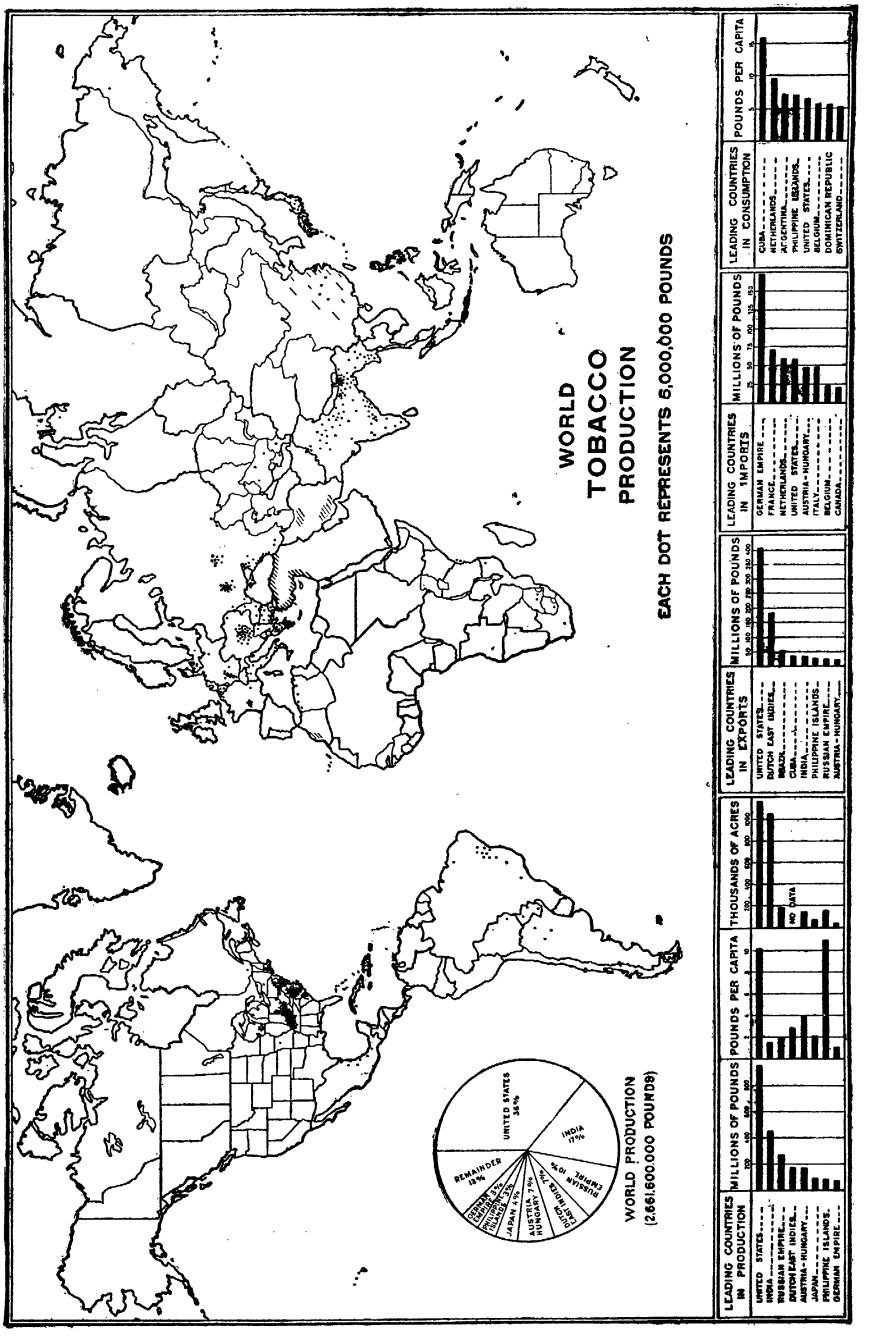

FIG. 65. *Tobacco.*—Although few crops are cultivated under a wider range of climatic conditions, tobacco is produced on a commercial scale in only a few areas situated so favorably as to yield a leaf of superior quality. In the United States, the Connecticut Valley and Florida produce excellent wrapper and binder leaf for cigars, Pennsylvania and Ohio chiefly filler, and Wisconsin binder leaf. Kentucky produces the well-known Burley, Virginia and the Carolinas flue-cured tobacco. Outside the United States, Sumatra and Java produce a famed cigar wrapper type and Turkey the finest cigarette leaf, while Cuba, especially the noted Vuelta Abajo district, leads the world in the excellence of its cigar leaf.

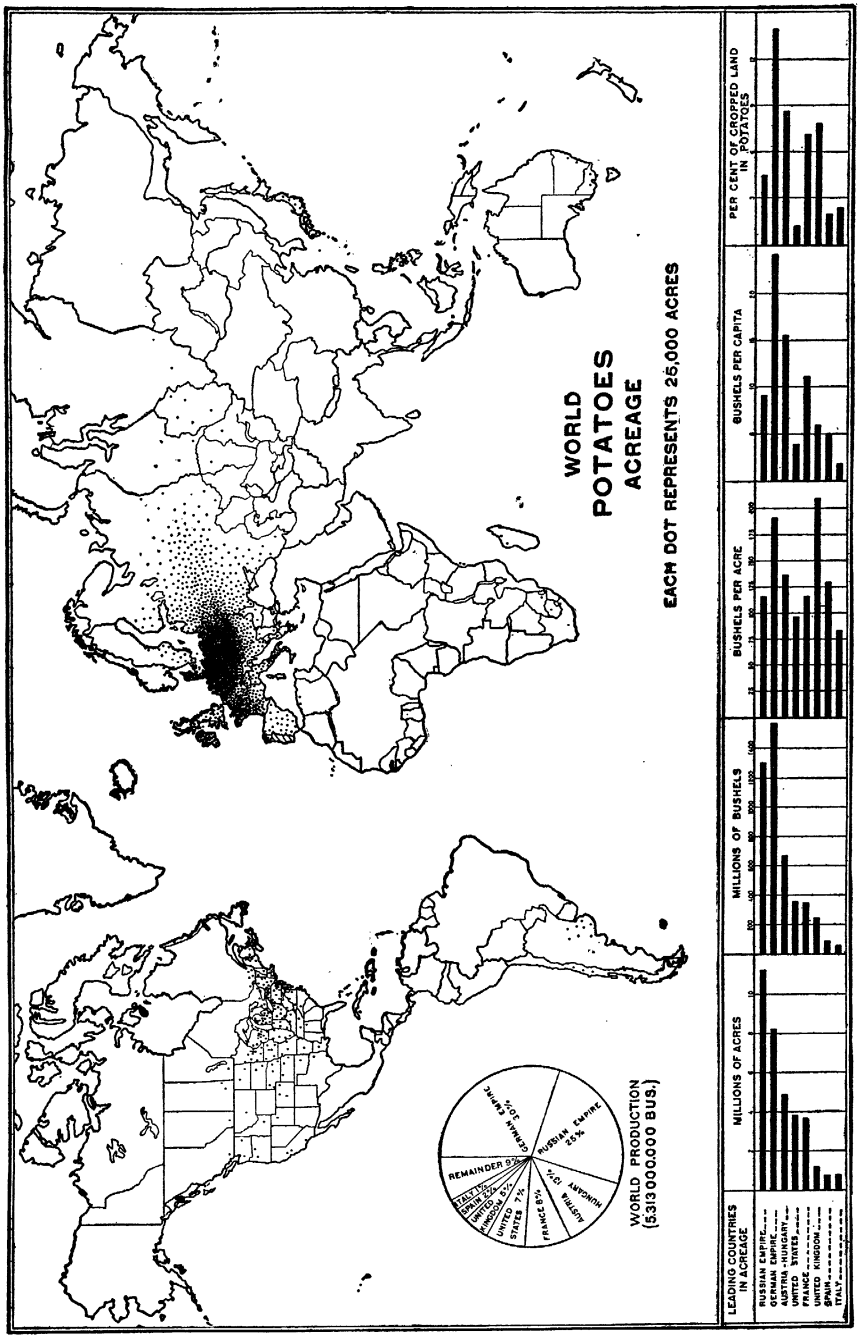

FIG. 66. *Potatoes.*—Although the potato was in origin an American plant, over 90 per cent of the world's potato crop is now grown in Europe, the production of that continent vastly exceeding in volume and almost equaling in value the wheat crop of the world. Germany has an average potato acreage twice as great and a production four times as great as that of the United States. Nearly 14 per cent of the cropped land in Germany is in potatoes as compared with 1.2 per cent in the United States. Russia and Austria-Hungary also each have a greater acreage and yield of potatoes than the United States. The Southern Hemisphere has no important potato-raising centers.

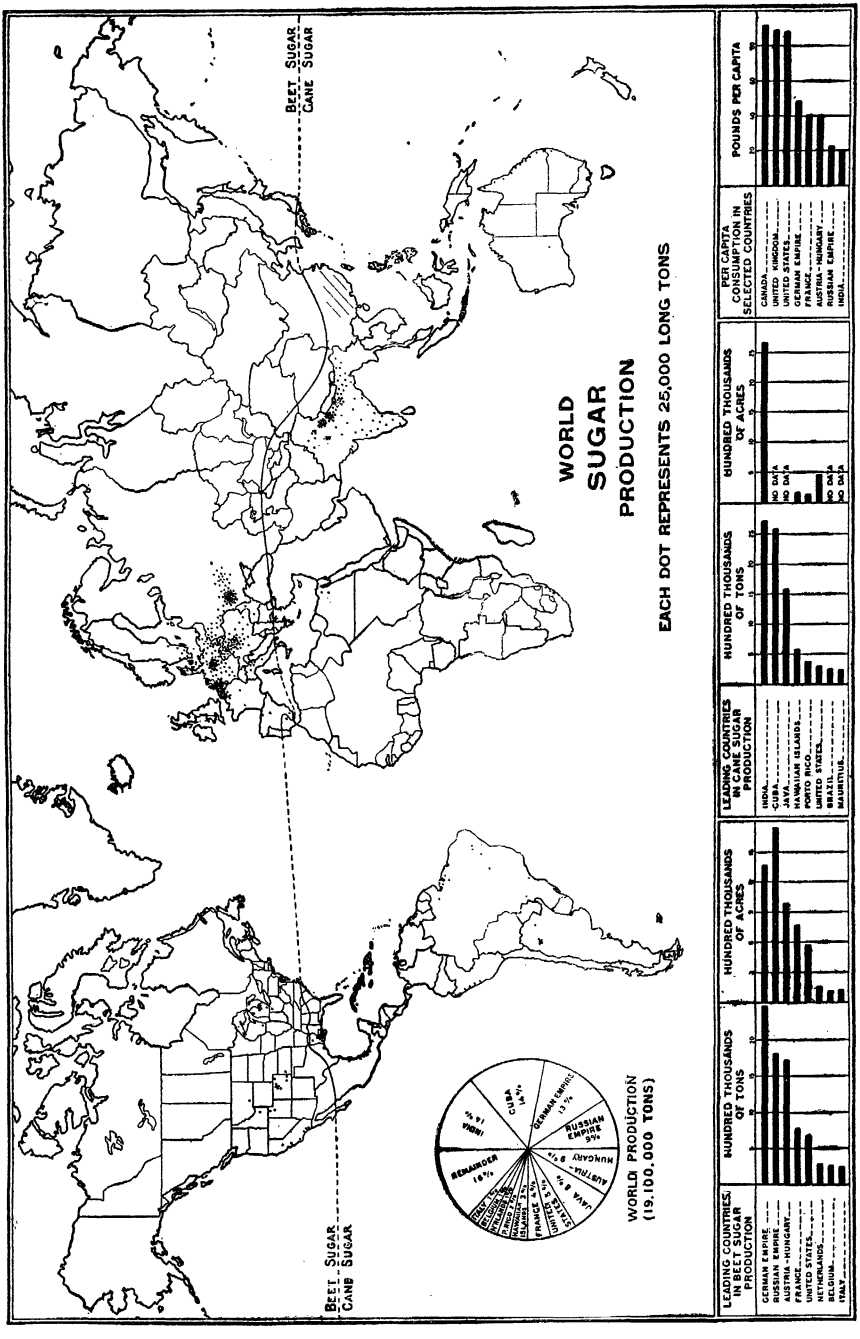

FIG. 67. *Sugar.*—About half the world's sugar comes from the beet and half from cane. The areas occupied by these two sugar crops are, in general, very distinct. The centers of beet-sugar production are southwestern Russia, Austria, central Germany, northern France, southern Belgium, Michigan, Colorado, and California. The centers of cane-sugar production are the Ganges Valley of India, Java, Hawaii, Cuba, Porto Rico, and Louisiana. The course of the dividing line on the map through Asia is merely conventional, since there is no beet-sugar production to the north of the line. The sugar crops of Argentina, South Africa, and Australia are entirely cane.

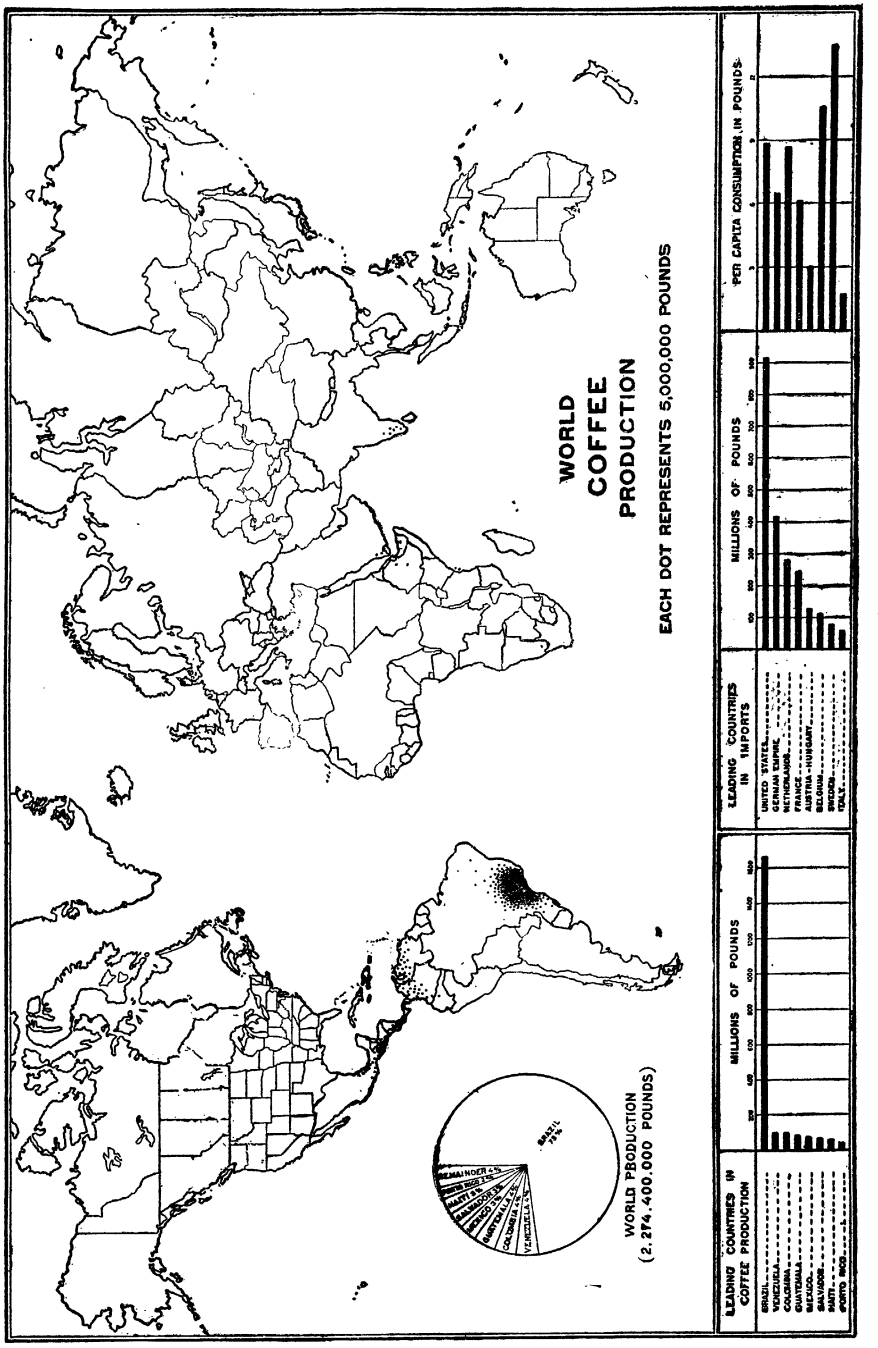

FIG. 68. *Coffee.*—Although the coffee tree is native to the Eastern Hemisphere, 95 per cent of the world's crop is now grown in South and Central America and the West Indies. The outstanding importance of the Brazilian area on the map distracts attention from other important areas, namely, Venezuela, Colombia, Central America, Mexico, and the West India Islands, Abyssinia, southern Arabia, India, and Java. The large production of Brazil (over 70 per cent of the world crop) makes it impossible to restrict properly the dotted area in Brazil and still show less important producing regions.

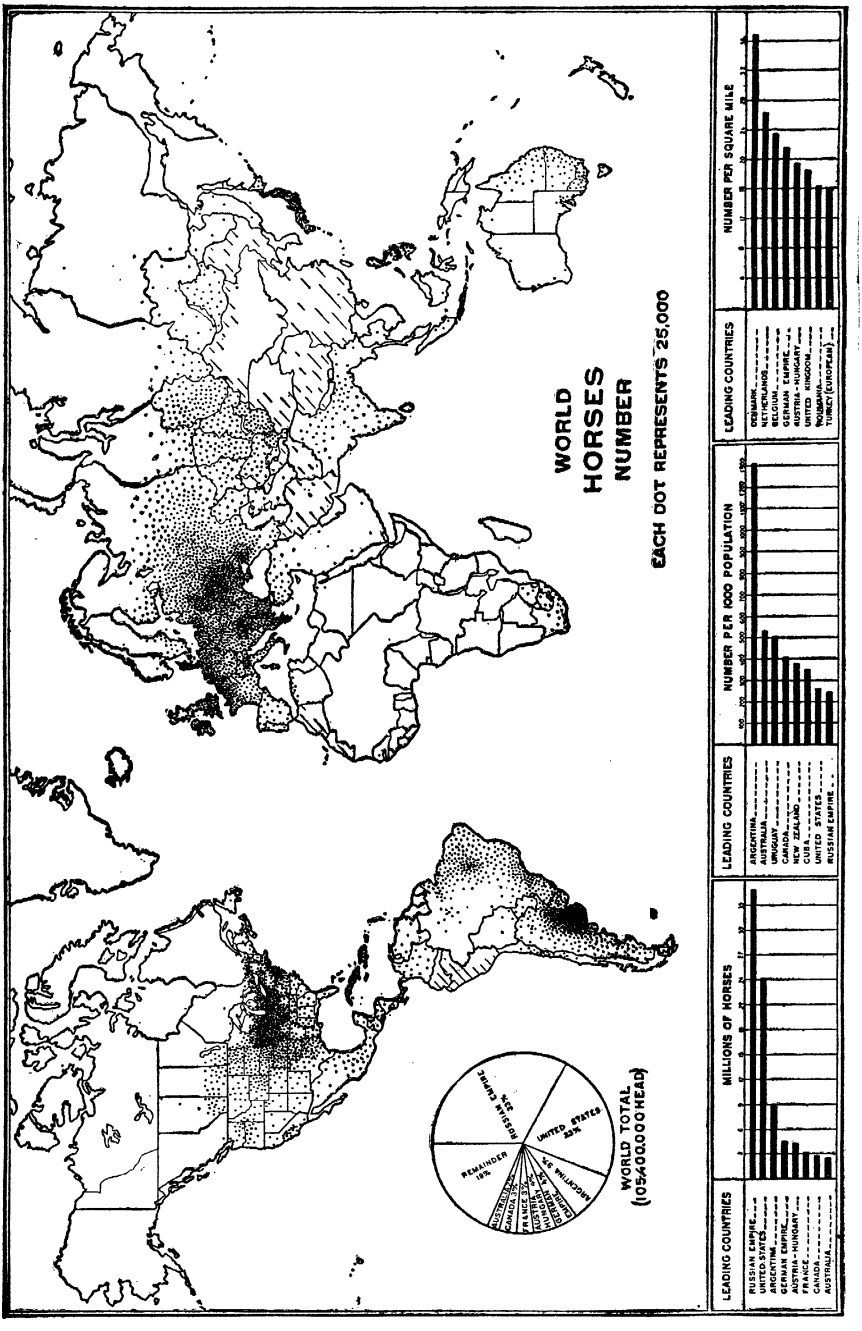

FIG. 69. *Horses.*—In Europe and in countries settled by Europeans, the distribution of horses corresponds in general to the distribution of the human population. Russia and the United States, the largest agricultural nations, lead in actual number of horses. Relative to the population horses are most numerous in those countries which have extensive agricultural and grazing industries and sparse populations. The number of horses relative to area, however, is greatest in northwestern Europe, where agriculture is highly developed and intensive. In the Orient, where human labor is plentiful and cheap, and cattle are used both in agricultural labor and in transportation, horses are few.

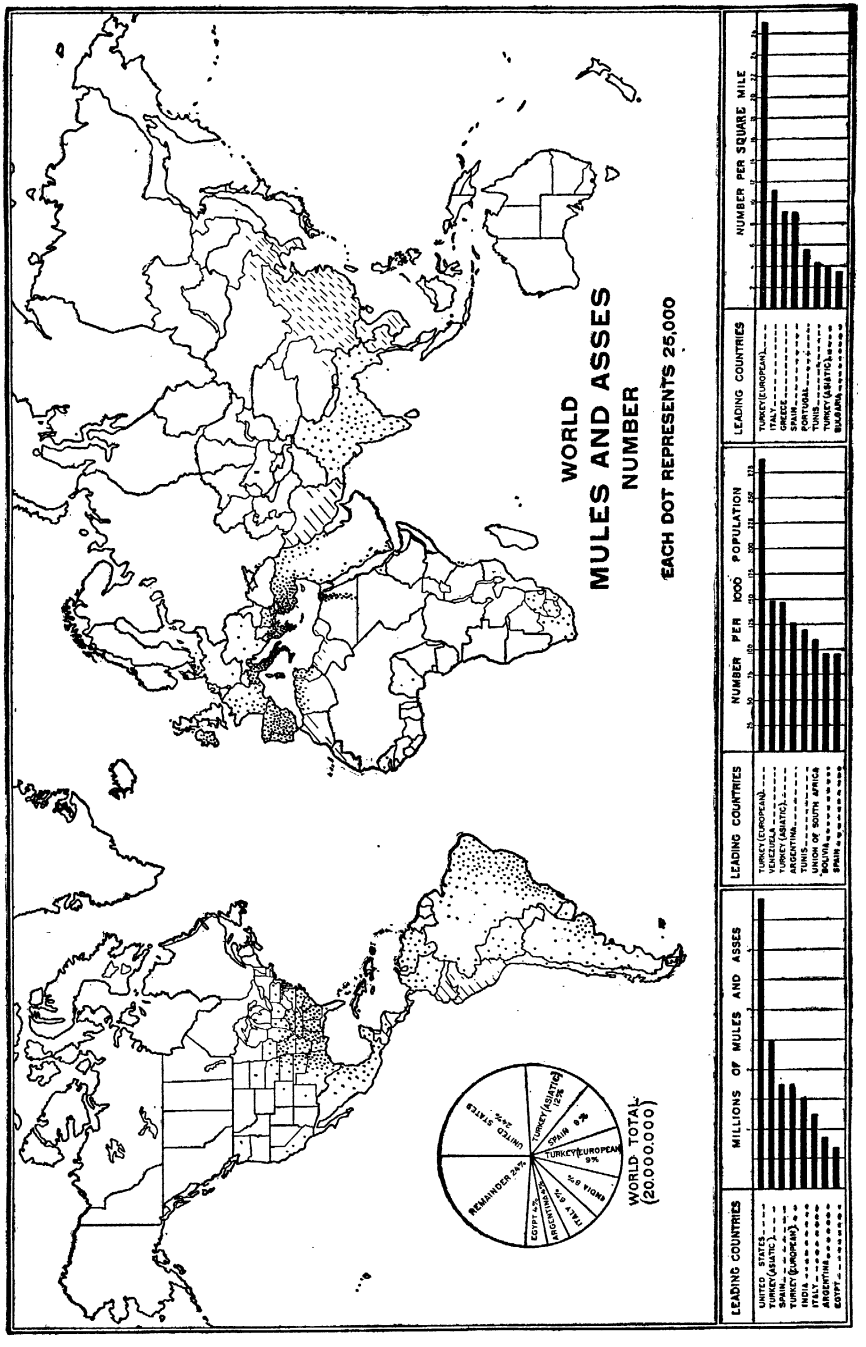

FIG. 70. *Mules.*—The geographic distribution of mules and asses when compared with that of horses shows striking dissimilarity. Owing to their hardihood, their stolidity, their sureness of foot, and ability to subsist on meager forage, the mule and the ass are the beasts of burden of the dry and rough lands or of poor peoples. Their importance is greatest in southern Europe, in the mountains of South America, in Ireland, and among the negro farmers of southern United States. Asses are more common than horses in China, but their number is not known. The number of mules and asses shown in Brazil is an estimate and is not included in the graphs.

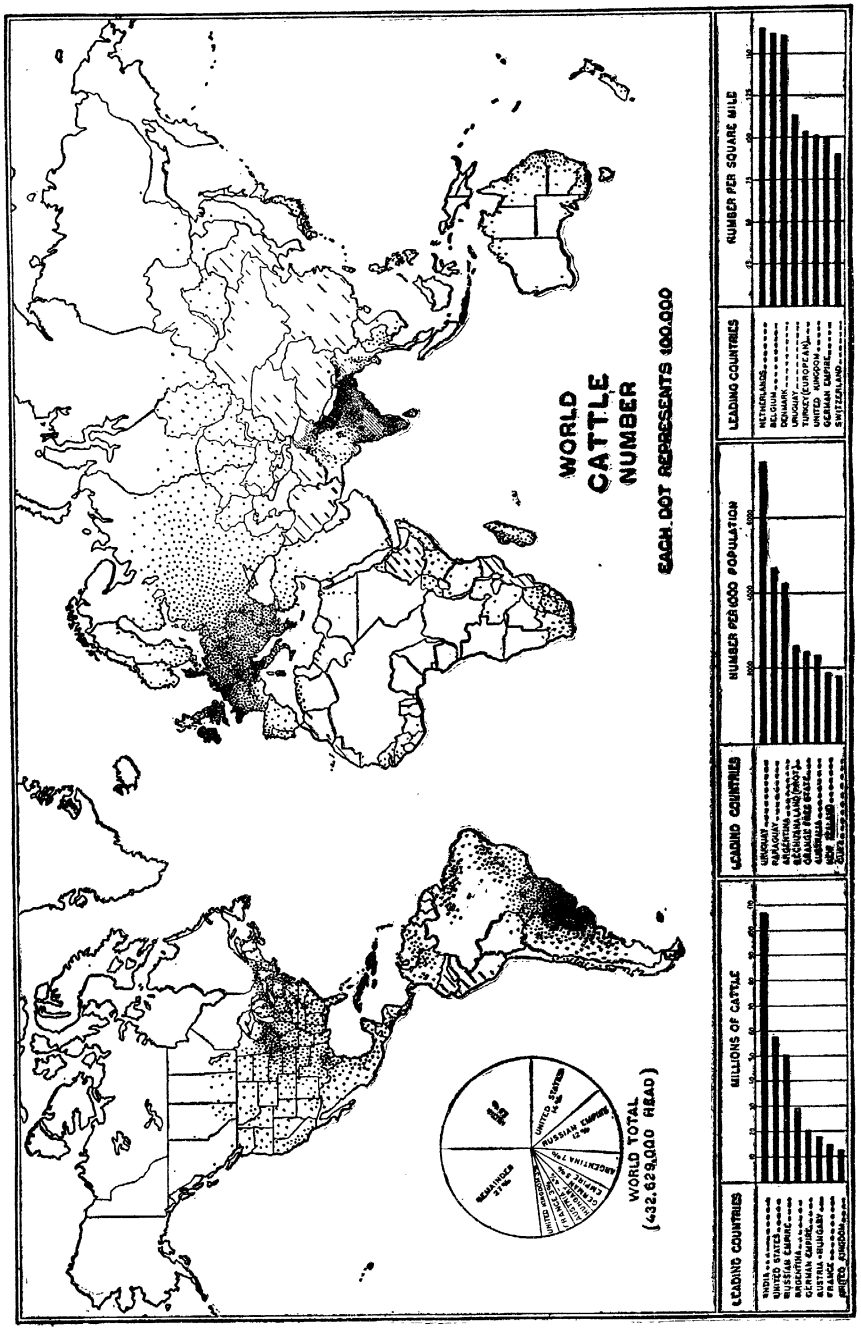

FIG. 71. *Cattle.*—The four important cattle-producing regions of the world are Europe, particularly the northwestern portion, India, the United States, eastern Argentina, Uruguay, and southern Brazil. Of these countries India ranks first in number, although the cattle are used very little for meat or milk but mostly for beasts of burden. It should be observed, however, that owing to the character of the projection the greater density of cattle in India than in Europe is only apparent. Relative to the population the number of cattle is highest in those new countries of the Southern Hemisphere where the population is sparse and the grazing industry extensive.

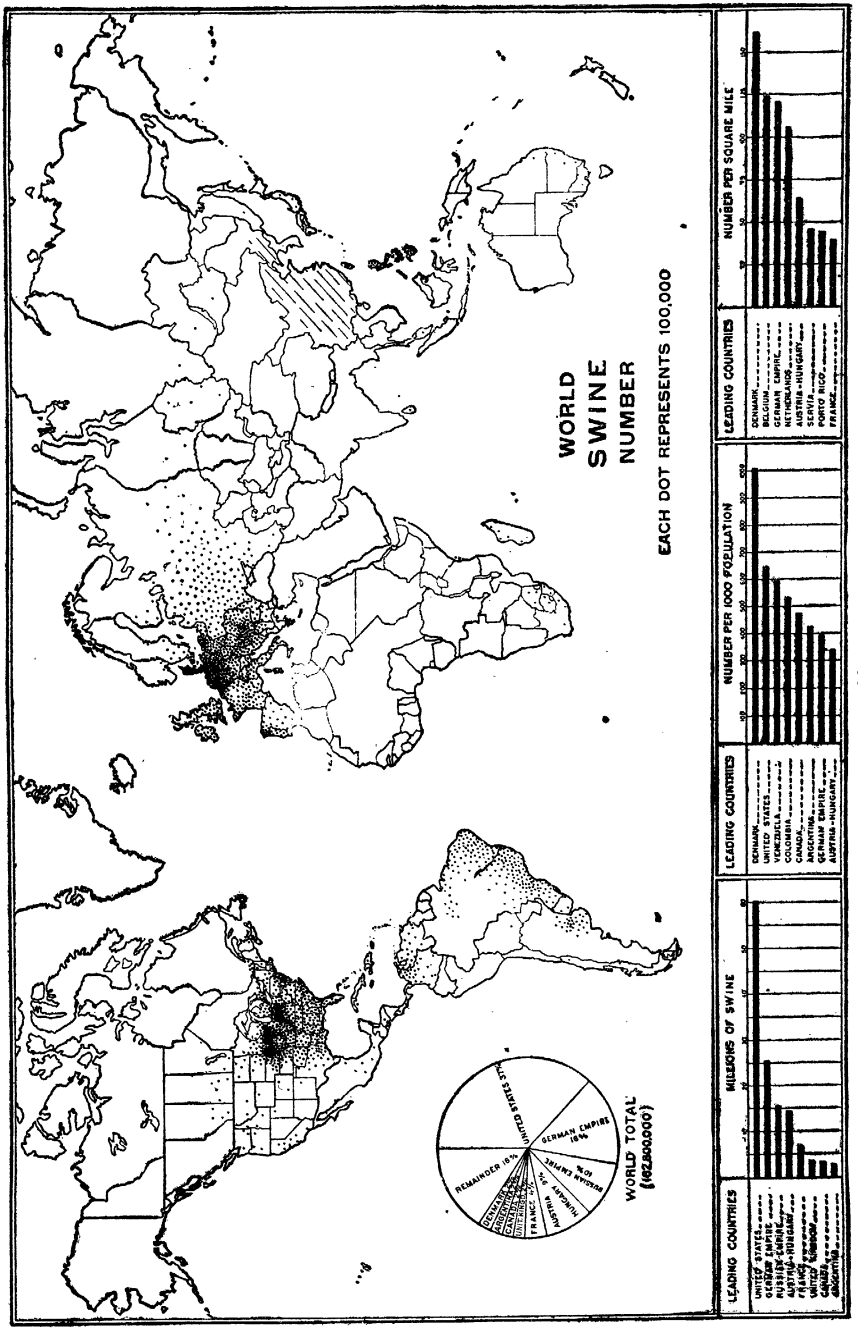

FIG. 72. *Swine.*—The United States has more swine (hogs) than any other three nations of the world, but in number per square mile it falls far behind many European countries. Swine are most numerous in countries having relatively intensive agriculture and an abundance of certain food products, particularly corn, barley, potatoes, and dairy by-products. In the United States the geographic distribution of swine corresponds closely with that of corn, but in Europe it follows rather the distribution of potatoes and dairy cows. Swine are barred from countries under Moslem influence. They are known to be numerous in China, but their number or distribution can not even be approximated.

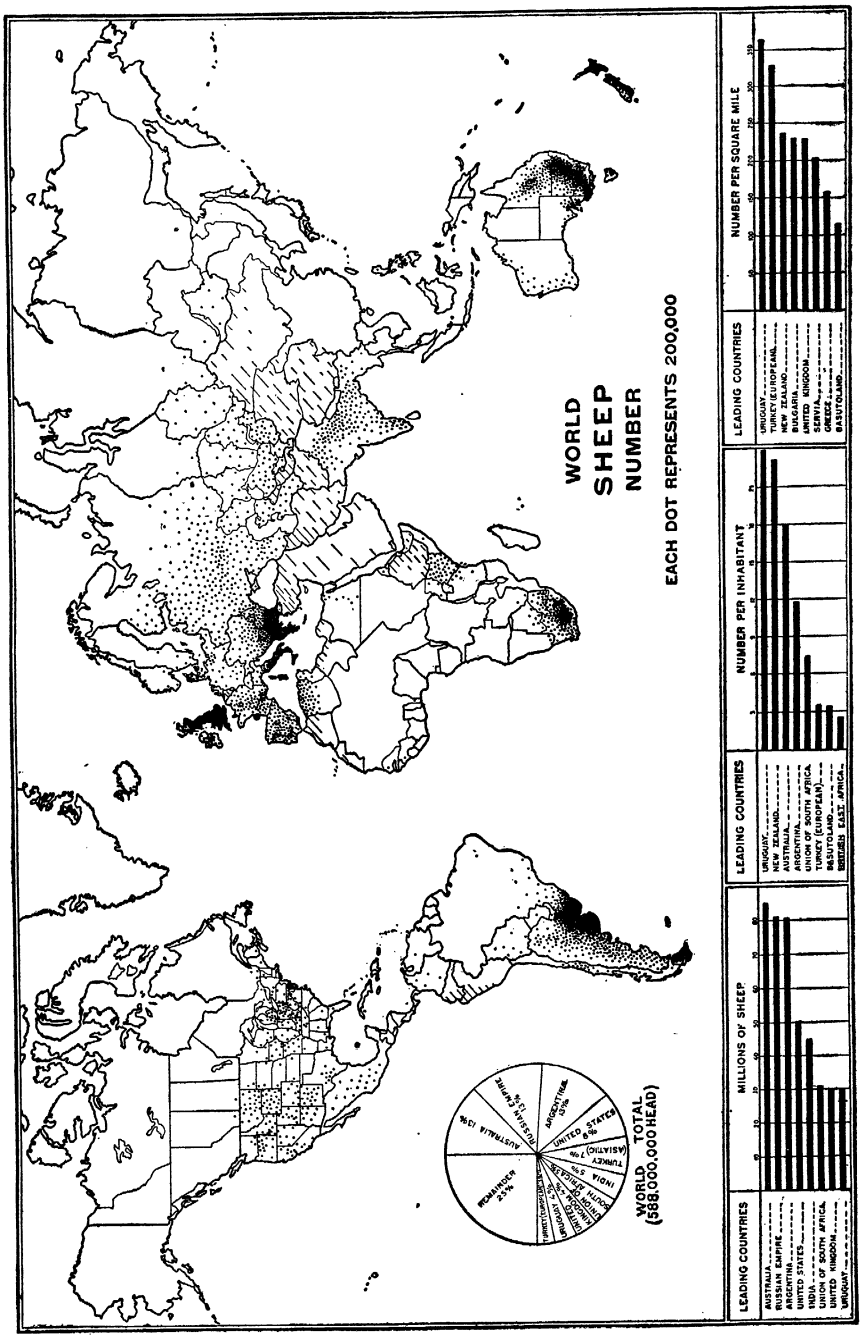

FIG. 73. *Sheep.*—There are six world centers of sheep raising, of which four—the South American countries, South Africa, Australia, and New Zealand—are new lands with sparse population and are all located in the Southern Hemisphere. In Asia Minor and in the Balkan States conditions of topography, climate, and the nomadic habits of the people in the recent past cause sheep to be important farm animals. In Great Britain many factors combine to make sheep raising a prominent industry in spite of apparently unfavorable climatic conditions. The Russian Empire and the United States are, owing to large area, far down the list in number per square mile.

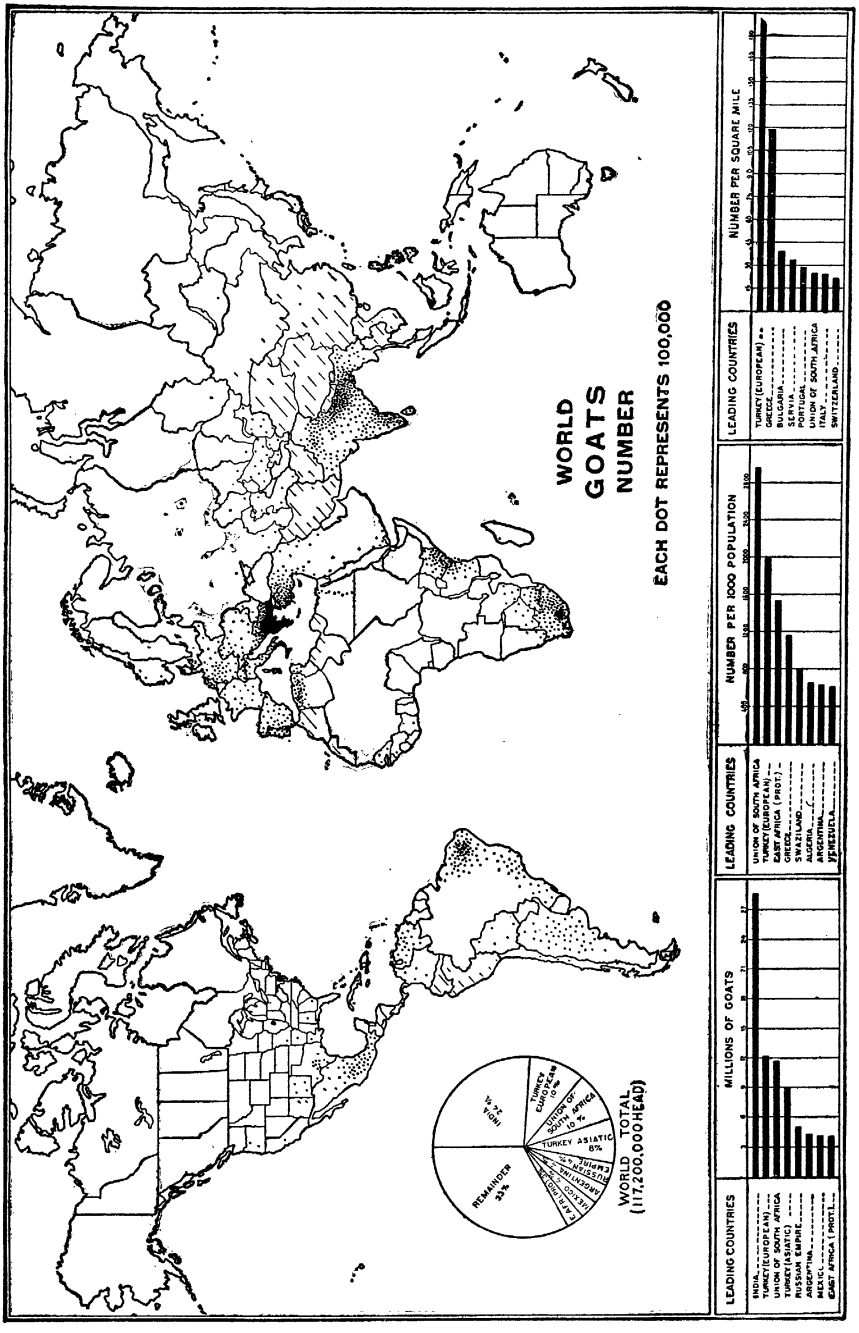

FIG. 74. *Goats.*—Goats are found in practically all the countries of the world, but their distribution is much the densest in the Balkan States of southeastern Europe. The other principal centers are in Asia Minor, northern Africa, India, East and South Africa, Argentina, Brazil, Venezuela, Mexico, the southwestern United States, and the countries of western Europe. The goat is even hardier than the sheep in its ability to subsist on scant forage and in regions of rough topography. It has the added advantage of a relatively large milk production. The goat is therefore found principally in rough or dry lands or among poor peoples.